

What Is Claimed Is:

1. A process for producing a modified electrolyte comprising an amine treatment step of contacting a solid polymer electrolyte or a precursor thereof with an amine compound.

2. The process for producing the modified electrolyte according to claim 1, further comprising a heat treatment step of heating the solid polymer electrolyte or the precursor thereof after the amine treatment step.

3. The process for producing the modified electrolyte according to claim 1, further comprising a base treatment step of contacting the solid polymer electrolyte or the precursor thereof, with a base after the amine treatment step.

4. The process for producing the modified electrolyte according to claim 2, further comprising a base treatment step of contacting the solid polymer electrolyte or the precursor thereof, with a base after the amine treatment step.

5. The process for producing the modified electrolyte according to claim 1, wherein the solid polymer electrolyte is a perfluoro polymeric electrolyte.

6. The process for producing the modified electrolyte according to claim 1, wherein the amine compound is at least one compound selected from the group consisting of ammonia, alkali metal bis(trimethylsilyl)amide, sodium amide, 1-hexylamine, ethylamine, propylamine, butylamine, pentylamine, heptylamine, nonylamine, decylamine, perfluoromethylamine, perfluoroethylamine, perfluorobutylamine,

perfluoropentylamine and perfluoroheptylamine.

7. The process for producing the modified electrolyte according to claim 1, wherein the amine compound has a diffusion rate in the solid polymer electrolyte or the precursor thereof which is higher than the reaction rate with the solid polymer electrolyte or the precursor thereof.

8. The process for producing the modified electrolyte according to claim 1, wherein the base is at least one compound selected from the group consisting of:

trimethylamine, triethylamine, pyridine, DBU (1,8-diazabicyclo[5.4.0]-7-undecane) and DBN (1,5-diazabicyclo[4.3.0]non-5-ene);

sodium hydroxide, lithium hydroxide, calcium hydroxide, aluminum hydroxide, potassium hydroxide, sodium carbonate, potassium carbonate, sodium hydrogencarbonate and sodium alkoxide;

sodium hydride, potassium hydride, calcium hydride, lithium aluminum hydride, sodium borohydride; and

butyl lithium, sodium cyclopentadienide and phenyl lithium.

9. The modified electrolyte obtained using the process according to claim 1.

10. An electrochemical device using the modified electrolyte according to claim 9.

11. A solid polymer electrolyte fuel cell using the modified electrolyte according to claim 9.

12. The modified electrolyte obtained using the process

according to claim 2.

13. An electrochemical device using the modified electrolyte according to claim 12.

14. A solid polymer electrolyte fuel cell using the modified electrolyte according to claim 12.

15. The modified electrolyte obtained using the process according to claim 3.

16. An electrochemical device using the modified electrolyte according to claim 15.

17. A solid polymer electrolyte fuel cell using the modified electrolyte according to claim 15.

18. The modified electrolyte obtained using the process according to claim 4.

19. An electrochemical device using the modified electrolyte according to claim 18.

20. A solid polymer electrolyte fuel cell using the modified electrolyte according to claim 18.

21. A process for producing a modified electrolyte comprising a first step of:

introducing, to a solid polymer compound having a functional group A, a first modifying agent comprising at least one functional group B capable of reacting with the functional group A thereby forming a first intermediate acid group and at least one functional group C capable of forming a terminal acid group or a second intermediate acid group; and

reacting the functional group A with the functional group B.

22. The process for producing the modified electrolyte according to claim 21, wherein the process further comprises a second step of:

introducing, to the solid polymer compound having been reacted with the first modifying agent, a second modifying agent comprising at least one functional group D capable of reacting with the first or second intermediate acid group and at least one functional group E capable of forming a terminal acid group or a third intermediate acid group; and

reacting the first or second intermediate acid group with the functional group D.

23. A modified electrolyte comprising:

a solid polymer compound having side chains;

at least one terminal acid group present at terminal ends of the side chains; and

at least one intermediate acid group and/or modified acid group present within the side chains identical with the side chains containing the terminal acid group.

24. The modified electrolyte according to claim 23, wherein the intermediate acid group is at least one selected from the group consisting of a bisulfonfyl imide group, a sulfonyl carbonyl imide group, and a biscarbonyl imide group.

25. The modified electrolyte according to claim 23, wherein, the terminal acid group is at least one selected from the group consisting of a sulfonic acid group, a carboxylic acid group, and a phosphonic acid group.

26. The modified electrolyte according to claim 23,

wherein the solid polymer compound is a perfluoro polymeric compound.

27. The modified electrolyte according to claim 23, wherein a crosslinking group for crosslinking the solid polymer compounds is further provided.

28. The modified electrolyte according to claim 27, wherein the crosslinking group is at least one selected from the group consisting of a bissulfonyl imide group, a sulfonyl carbonyl imide group, and a biscarbonyl imide group.

29. The modified electrolyte according to claim 23, wherein the electroconductivity is 0.05 S/cm or higher.

30. The modified electrolyte according to claim 23, wherein the creep elongation formed by applying 0.8 MPa of stresses at 160 °C for 4 minutes is 150 % or less.

31. The modified electrolyte according to claim 23, wherein the modified electrolyte is obtained by:

introducing, to the solid polymer compound having a functional group A, a first modifying agent comprising at least one functional group B capable of reacting with the functional group A thereby forming a first intermediate acid group and at least one functional group C capable of forming the terminal acid group or a second intermediate acid group; and

reacting 20 % to 100 % of the functional group A with the functional group B.

32. The modified electrolyte according to claim 31, wherein the functional group A is a sulfonamide group, and the functional group B is at least one selected from

the group consisting of a sulfonyl halide group, a carbonyl halide group, a phosphonyl halide group, a sulfonate ester group, a carboxylate ester group, and a phosphonate ester group.

33. An electrochemical device using the modified electrolyte according to claim 23.

34. A solid polymer electrolyte fuel cell using the modified electrolyte according to claim 23.

35. An electrochemical device using the modified electrolyte according to claim 27.

36. A solid polymer electrolyte fuel cell using the modified electrolyte according to claim 27.